

SUSTAINABILITY

# Solving the Looming Talent Shortage in the Energy Industry

by Michael Valocchi and Mozhi Habibi

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These days, each passing season seems to mark a new weather record, whether hottest year in the US, driest drought in Australia, or a record heat wave in South Korea. The trend towards more extreme weather appears to be continuing around the globe.

So just when electric systems need to operate flawlessly – whether to power air conditioners, pump water, or heat homes – long-term challenges to power grids are multiplying. From the US to Europe and Asia, electricity players are facing a similar set of human and physical challenges. The unprecedented loss of highly-skilled, senior workers is compounding challenges posed by aging infrastructure, rising power demand, and climate stress.

While the labor challenge is especially stark in the U.S., utility systems in most advanced economies are facing similar demographic dynamics. New workers are not entering the market as fast as veterans – particularly engineers – are retiring. In the U.S., for example, a backlog of baby-boomer retirees is expected to turnover upwards of 40 percent of utilities' 400,000-strong workforce, according to a study by the Task Force on America's Future Energy Jobs produced by the Bipartisan Policy Center (BPC). The need for digitally savvy technical hires is especially pronounced. By 2030, the BPC predicts, utilities in the United States will need to hire 150,000 additional workers in information-technology intensive roles.

The consensus solution to the infrastructural challenges is to continue the build-out of a smarter, self-healing digital grid (which President Obama mentioned in his June 25th speech on climate change), while integrating new technologies with the old. But solving the workforce problem is inherently part of this process. A digitally-skilled workforce is vital to help deploy advanced digital technologies that can streamline and automate grid operations.

The industry's most competitive companies are using this generational shift as an opportunity to transform their organizations, aggressively recruiting for digital fluency at all levels – from research engineers to midlevel customer service managers. To this effect, we've seen them implementing programs that cultivate the following vital milestones on the way towards a smarter grid:

**Grooming more data scientists.** Utilities are taking a crucial first step of adding sensors and digital meters across their networks. Once in place, this new generation of devices can feed a deluge of data, which presents huge opportunities to discover early signals that can prevent faults and increase grid reliability. Data scientists are vital in analyzing data not only from these devices, but also from customers' signals in the form of unstructured data from posts on social media sites, so technical troubles can be detected early and communicated. Behind company walls, data scientists' ability to mine operational data is helping to develop digital repositories of workers' best practices, and helping fewer workers do more, via collaboration tools.

Utility companies are now developing these advanced data skills through public-private initiatives. For example, the Pittsburgh-based University Energy Partnership is working with the Energy Department's National Energy Technology Laboratory and URS Corp. Collaborating with five research universities, the program is cultivating engineering, software, and material science research projects that address key grid challenges, from transmission and distribution problems to computer-aided simulation of carbon capture.

**Getting the attention of the next generation.** Other utilities and businesses are partnering with local colleges to raise awareness about smart grid job opportunities and start training talent to replace those departing boomers. In 2010, Florida Power & Light estimated that 65 percent of its workforce was near or eligible to retire. Now their Gateway to Power program ranks among the largest of the 52 smart grid labor training programs seeded by the 2009 Recovery Act. That same year the utility partnered with seven regional colleges and universities to promote a series of programs focused on ensuring the graduates had the knowledge and skills to design, plan, construct, operate, and maintain a modern electricity delivery system, including power system infrastructure and information systems.

**Encouraging trade skills.** Traditional vocational and technical education programs are also part of the answer. San Francisco-based utility Pacific Gas & Electric (PG&E), which is facing the potential retirement of two in every five of its workers by 2015, is collaborating with colleges, vocational schools and universities across the state, together with the Gates Foundation, and other public and private partners to train tomorrow's workers. The result is PG&E's PowerPathway program which has already graduated hundreds of new workers with skills that span from linemen to advanced power engineering. The program has also helped PG&E's current staff to upgrade their skills.

August 14th marked the tenth anniversary of the US's worst-ever blackout, a grid failure that left more than 50 million North Americans in the dark for days. While experts agree the grid has improved since then, the economic toll still looms according to a recent White House report. To avoid these costly disruptions, investment in both the workforce and the infrastructure is a rising imperative around the world, both in mature markets such as North America, Western Europe as well as the growing economies such as Latin America, Africa and Middle East.


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A new generation of smarter energy technologies, coupled with a workforce that is just as digitally savvy, holds great promise to ensure reliability of the grid, decrease economic losses due to power outages, and meet the world's growing demand for power. There is time, technology, and will to avoid this fate, but the clock is ticking.

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